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9. A method according to claim 1, in which spatial control of intermixing is controlled using a variable profile mask pattern.

10. A method according to claim 1 further comprising the steps of forming a photoresist on the structure and differentially exposing regions of the photoresist in a spatially selective manner in dependence on the degree of quantum well intermixing required, and subsequently developing the photoresist.

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13. A method according to claim 10, in which the photoresist is applied to a masking layer.

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15. A method according to claim 13, further comprising the step of etching the structure with the developed photoresist in situ to provide a differentially etched masking layer.

16. A method according to claim 1, in which an electron cyclotron resonance system is used to generate a plasma, wherein the microwave power of the ECR system is between 300 and 3000 W, more preferably between 1000 and 2000 W, the process temperature is between 25 and 500°C, more preferably between 25 and 200°C, the process pressure is between 0.1 and 100 mTorr, more preferably between 20 and 50 mTorr, and the exposure time is between 30 seconds and 1 hour, more preferably between 4 and 14 minutes.